



# UNITED STATES PATENT AND TRADEMARK OFFICE

S.~  
UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 09/370,178   | 08/09/1999  | BIN LI               | RO4474              | 7728             |
| 26123  | 7590        | 03/09/2005           | EXAMINER            |                  |
| BORDEN LADNER GERVAIS LLP<br>WORLD EXCHANGE PLAZA<br>100 QUEEN STREET SUITE 1100<br>OTTAWA, ON K1P 1J9<br>CANADA |             |                      | CHANG, EDITH M      |                  |
|  |             |                      | ART UNIT            | PAPER NUMBER     |
|  |             |                      | 2637                |                  |
| DATE MAILED: 03/09/2005  |             |                      |                     |                  |

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                           |                     |  |
|------------------------------|---------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b>    | <b>Applicant(s)</b> |  |
|                              | 09/370,178                | LI ET AL.           |  |
|                              | Examiner<br>Edith M Chang | Art Unit<br>2637    |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 14 December 2004.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 8-20 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 8-17 and 20 is/are rejected.  
 7) Claim(s) 18-19 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

|  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|  | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on September 17, 2004 has been entered.

### ***Claim Objections***

2. Claim 8-20 are objected to because of the following informalities:

Claim 8, line 6: “vectors” is suggested changing to “probability vectors”, “each state” is suggested changing to “the each possible state”; line 12: “possible information” is suggested changing to “possible encoded information”, “each state” is suggested changing to “the each possible state”; line 13: “probability vectors for states” is suggested changing to “the probability vectors for the each possible state”; line 15: “such states” is suggested changing to “the each possible state”; line 18: “said probability vectors” is suggested changing to “the probability vectors”; line 19: “the possible states” is suggested changing to “possible states”, “a respective” is suggested changing to “said one”; line 20: “every path” is suggested changing to “every transition path”; and line 21: “every symbol” is suggested changing to “every information symbol”.

Claim 10, line 1: “for each” is suggested changing to “for each possible”.

Claim 11, line 1: "each vector" is suggested changing to "each probability vector".

Claim 14, line 2: "information symbol" is suggested changing to "symbol"; "the total probabilities for all of the states" is suggested changing to "the total probability for the each possible state".

Claim 15, lines 6-7: "the symbol" is suggested changing to "a symbol"; line 11: "said probabilities" is suggested changing to "said determined probabilities", "total" is suggested changing to "a total"; line 14: "the respective states" is suggested changing to "respective states"; line 17: "a probability ratio for an information symbol at the start" is suggested changing to "the probability ratio for the information symbol at a start"; line 18: "the possible states" is suggested changing to "possible states"; line 19: "a respective information" is suggested changing to "the respective"; line 20: "path" is suggested changing to "transition path"; and line 21: "symbol" is suggested changing to "information symbol".

Claim 16, line 2: "each" is suggested changing to "the respective".

Claim 18, line 7: "the symbol" is suggested changing to "an information symbol"; line 11: "said probabilities" is suggested changing to "said determined probabilities", "total" is suggested changing to "a total"; line 14: "the respective states" is suggested changing to "respective states"; line 15: "an information" is suggested changing to "the information", "the start" is suggested changing to "a start"; line 16: "the possible states" is suggested changing to "possible states"; lines 16-17: "a respective information" is suggested changing to "the respective".

Claim 19, line 2: "information symbol" is suggested changing to "symbol"; "the total probabilities for all of the states" is suggested changing to "the total probability for each state".

Claims 9, 12-13, 17, and 20 are dependent on the object claims 8, 15, and 18.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 8-17 and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8, line 17, “for an information symbol δ information symbols” does not understand a probability is determined for an information symbol or information symbols. It does not clearly indicate the determination is for what.

Claim 15, line 5: “each vector” is not clearly indicated that it is the “a vector of logarithmic probability ratios” or other vector; line 15: “the respective probabilities” lacks antecedent basis, “such states” does not clearly indicate what states are “such states”; line 18: “the vectors” lacks antecedent basis.

Claim 16, line 2: “the total probabilities” lacks antecedent basis, “the states” does not clearly indicate which/what states of “the states”; the respective states recited in line 12 or the possible states recited in line 16, or others.

Claims 17 & 20, does not indicate clearly how the decoder arranged to carry out the method.

Claims 9-14 are dependent on the rejected claim 8.

***Allowable Subject Matter***

5. Claims 8-17 and 20 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.
6. Claims 18-19 would be allowable if rewritten to overcome the objection(s) set forth in this Office action.
7. The following is a statement of reasons for the indication of allowable subject matter:

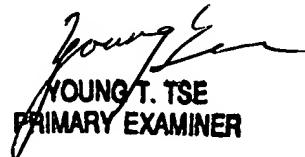
The prior art of record fails to teach or suggest, alone or in a combination, among other things, at least a method of decoding encoded binary information symbols as a whole, the combination of elements and features, which includes the steps of: at an information symbol time, providing/updating without any backwards computation probability vectors for each state of a decoding trellis; at a next information symbol time, for each state and for every transition path of the decoding trellis, do 1) determining path/state probability; for every symbol value, do 2) determining a total probability; 3) merging probability vectors; 4) determining a probability ratio, the soft output. Wherein the steps 1) to 4) are performed for each and every transition path and steps 2) to 4) are performed for each and every information symbol.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M Chang whose telephone number is 571-272-3041. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayanti Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edith Chang  
February 28, 2005

  
YOUNG T. TSE  
PRIMARY EXAMINER